seen from the character of his researches, which deal for the most part with questions of minute structure and development, that he combines unusual power of close observation with originality of treatment and wide knowledge of methods. These qualities, together with a clear style of exposition, are those most needful for the production of a handbook for the guidance of students in the botanical laboratory; and the result does not disappoint the expectations of those who have been awaiting the appearance of Prof. Strasburger's volume.

The 600 pages of which the book consists are printed partly in large, partly in small, type, the former being intended for the beginner, the latter for the use of more advanced students. The whole is divided into thirty-four lessons, corresponding to the number of practical demonstrations habitually given in the course of one semester in a German University. But, as the author freely admits in his preface, it is not assumed that a detailed study of the objects named in one lesson could be made in the time during which one demonstration lasts; it is, however, stated that the time would usually suffice to give the student a general idea of the most important points. With due deference to Prof. Strasburger, in this admission lies the weak point in the book; if such a system as this be adopted with students on their first entrance into the botanical laboratory, and if the work be so presented to them that it should appear to them desirable rather to hurry through the study of a number of objects than to pay closer attention to a few, the result would naturally be the encouragement of a superficial style of observation; this method is not at all consistent with that usually adopted by German professors, and our experience as teachers on this side of the Channel does not lead us to approve of it. If, however, the student be not limited in respect of time, he would by carefully and successfully working through the course, both of large and small type, laid down for him, find himself at the end of it an accomplished laboratory botanist, well fitted to strike out a line of research for himself.

After giving a short introductory description of the microscope itself, and a list of makers and prices, Prof. Strasburger leads the student on by gradual steps, from the observation of starch-grains and their reactions, to the more complete study of the cell, with its included bodies, special attention being paid to the plastids and their various modifications. Having thus become acquainted with the general morphology of the cell, he is introduced to the study of tissues, the epidermis with its appendages being taken first, and subsequently the vascular bundles and surrounding tissues, as seen successively in the axis, root, and leaf; the constituent elements of these several tissues in the mature condition are made the subject of detailed observation. It is to be remarked, however, that little attention is paid to the comparative study of the *course* of the vascular bundles in the shoot, and the methods of its investigation; it is true that on pp. 282-303 this subject is dealt with in small type, but even there the treatment is almost entirely confined to the modifications of arrangement at the point of transition from stem to root; thus the student who works through the large type only will gain a very complete knowledge of the details of structure of the vascular bundle in various types of plants, while his knowledge of the arrangement of the whole bundle-systems in those plants may be very limited.

This course of study of the tissues of the vascular plants in the mature condition having occupied eighteen chapters, the 19th and 20th are devoted to a comparative investigation of the structure of growing points of stems and roots, and the development of tissues, while later chapters deal successively with the structure of the vegetative organs of the Mosses and of various forms among the Thallophytes. In Chapters XXIV.-XXXII. Prof. Strasburger treads upon ground which is peculiarly his own, and brings before the student in succession various examples illustrating the reproductive processes in plants, starting from the lower forms, and proceeding to those of higher organisation. In the concluding chapter he illustrates the processes of nuclear- and cell-division by means of examples already familiar to those who have followed his brilliant researches in this quarter.

The whole book thus forms a compendious and, including the small type, a very complete course of instruction for the student in the botanical laboratory. Throughout the text ample information is given as to methods of treatment, and the use of reagents; and this information is drawn together and made accessible by means of a special index (No. III.). Of the other indices, which form a most valuable addition to the work, the first refers to the names of the plants investigated, and the second to the instruments used, while, finally, No. IV. is a general index to names, reagents, and apparatus.

Prof. Strasburger has treated the question as to the advisability of placing drawings of the objects under investigation before the student in the laboratory in a truly characteristic manner. He has illustrated his book by 182 woodcuts, all of which have been specially prepared for this work. Whatever may be our views as to the effect of the use of such figures on the student, these, being drawn in Prof. Strasburger's well-known style, constitute in themselves a most welcome addition to the figures hitherto published.

There can be no doubt that among senior students and teachers this book will be appreciated as its great merits deserve; and that it will henceforward be an indispensable item in the furniture of the botanical laboratory. But, as may be gathered from what has been said above, it is no book for the cramming student; time must be allowed, and even more time than its author seems to realise, if full advantage is to be reaped from the course laid down. For this reason it is to be feared that it will not be so popular among our junior students as with those who are in a position to judge better of its value. F. O. B.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.*]

Chalk and the "Origin and Distribution of Deep-Sea Deposits"

In a letter of Mr. Starkie Gardner's in the last number of NATURE (p. 192), he stated that my opinion as to the Chalk

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having been a shallow-water deposit was "based exclusively on the present habits of the very few genera of Mollusca that have survived from the Chalk period, and seems quite in contradiction to the far more important groups, the Sponges, Echinodermata, and the minute organisms of which the formation is so largely composed, while no opinion has yet found its way into the hands of geologists regarding the depth of water indicated by the Crustacea and the fishes of the Chalk." Mr. Gardner appears to have overlooked that passage in my Address to the Biological Section of the British Association (to which he refers in his letter), wherein I added, "Mr. Woodward tells me that the Chalk Crustacea are shallow-water forms." Dr. Woodward is certainly no mean authority on fossil Crustacea. As to the surviving genera of Chalk Mollusca being "very few" in number, I would refer him and my readers to the long list of genera given in my Address, which was furnished by our great palæontologist, Mr. Etheridge, and to the exclusively littoral habits of some of those genera. And with respect to the Sponges, Echinodermata, and minute organisms being "far more important groups" than the Mollusca, I must leave that question to naturalists in general. Sponges (silicious as well as horny or ceratose), and Echinoderms are notoriously not restricted to deep water. Quite the contrary. They live at every depth from the shore between tide-marks to the abyssal and benthal zones. The "minute organisms" which enter so largely into the composition of the Chalk, for the most part, if not entirely, inhabit the surface of the sea. J. GWYN JEFFREYS

June 30

Protoplasmic Continuity in Plants

IN the very interesting article on "The Continuity of the Protoplasm through the walls of Vegetable Cells," which appeared in NATURE of June 19 (p. 182), reference is made to the doubt which still exists as to "whether the continuity is maintained from the earliest stages, or is established later." This point is so important in its physiological bearings, as the article goes on to show, that I may, perhaps, be allowed to state that, with regard to one group of plants, the question appears to be already settled. I allude to the Red Sea-weeds or the *Florideæ*. The writer of the article makes no mention of these plants, but, as I have described elsewhere (see *British Association Report*, 1883, p. 547, and *Journal of Botany*, February and March 1884), many of them exhibit a very notable system of intercellular connections, which, extending over the whole thallus, renders the protoplasm practically continuous from the base of the frond to the extremities of its furthest ramifications. Now in these cases the continuity is certainly maintained from the first, and is due to the mode of cell division by which the thallus is built up. Into the details of this there is no need to enter further than to say that, when the protoplasmic body of a cell divides into two or more portions, these do not become completely separated from one another, but remain connected *inter se* by strands of protoplasmic material, which grow in thickness with the growth of the cells, and thus maintain the continuity from the earliest stages onward. So far, then, as concerns the *Florideæ*, I venture to think the physiological import of the phenomena of continuity may be safely discussed on the assumption of its existence *ab initio*. What that import may be I do not propose to consider, my object being simply to point to the *Florideæ* as throwing valuable light on the whole subject, and giving some support to the view that "the entire plant or organ is practically one whole—one mass of protoplasm cut up into chambers which communicate with one another, and bounded by a membrane on the exterior." THOMAS HICK

Aseismatic Tables for Mitigating Earthquake Shocks

WITH respect to Mr. C. A. Stevenson's letter in your last issue (p. 193), I may state that my information was obtained from Mr. R. H. Brunton's paper on "The Japan Lights" in *Proc. Inst. Civ. Eng.*, vol. xlvii., pp. 6-8, 35, and from the communication by Messrs. Stevenson in the "Discussion" on that paper (pp. 26-29). The results referred to by Mr. Stevenson have, perhaps, been obtained since this paper was read (November 14, 1876). W. TOPLEY

28, Jermyn Street, London, June 27

Black Rain

A REMARKABLE shower of black rain fell here and in the neighbourhood last Sunday, the 22nd inst. The forenoon had been fine, though somewhat hazy, but about 3.30 p.m. heavy cumuli formed to north and north-west. Gradually a dense mass of cloud and haze came from the northward, presenting a lurid, threatening aspect, and it become so dark that one could not read a book indoors. At 4.30 rain began to fall, at first a few drops, and soon after a heavy downpour. When this commenced I noticed a number of black objects floating in the air, which I at first took to be flies or winged ants, but they rapidly increased in number, and on looking at them more closely I found them to be particles of soot, on an average about the size of the common fly. Their number was so great that, it appeared for ten minutes to be snowing black, the descent of the blacks being slow, like that of snowflakes. After it had rained heavily for fifteen minutes, these "blacks" ceased and the air became lighter, but the rain continued for another hour, and altogether I measured ·30 inches in my gauge. I find on inquiry that this black rain was noticed in the whole neighbourhood—at least four miles to the north-east and two miles to westward, hence it cannot have been due to local chimneys. As far as I can ascertain, the shower was entirely local; it seems to have followed a narrow course from north to south only a few miles wide, and did not extend to either Eastbourne or Hastings.

Fletching, Sussex, June 24 W. J. TREUTLER

A Cannibal Snake

RATHER a strange occurrence came recently before my notice, and thinking perhaps you might care to insert it in your columns, I send you the facts of the circumstance. A few days since, towards evening, I killed a snake just close behind my house; it measured about a yard and a half in length, was one of the most deadly of the numerous kinds of snakes found in Java, and bears the name of "Oelar belang." On examining it later I found what I thought to be the tail of another small snake protruding from its mouth, but on pulling it out I was greatly surprised to discover that it was really a snake of the same species, and of almost the same length. There was certainly not more than three inches' difference in the length of the two snakes, and at the time I killed the outside snake only about an inch and a half or two inches of the tail of the one he had swallowed protruded from his mouth. The outside snake was of course considerably the thicker of the two, but this may be attributed to his having swollen after, or rather during, his tremendous meal. The natives here say that the two snakes must have been fighting, the victor afterwards swallowing his opponent. I should be pleased to know whether such an instance has ever before been brought before your notice, or whether it is really an uncommon case. EDWIN H. EVANS

Soemedang, Java, May 20

Peronospora infestans

ON the 22nd inst. I observed that this fungus had appeared on the haulm of the potato crop in one or two places in my garden in this city. On examining to-day a potato crop in another garden a mile distant from mine, I perceived that that crop was likewise affected. Considering the dryness of the spring weather, the appearance of the disease is remarkable. According to my observation, the attack of the mould is a month earlier than usual. It may be added that hereabouts, this season, blight of all kinds is prevalent, while last year was blight free. Inclosed is a specimen of diseased haulm. J. LL. BOZWARD

Worcester, June 24

KEPHIR

IN No. 10 of the *Journal of the Berlin Chemical Society* for June 23 is a communication on this substance by M. Struve of Tiflis, continued from a previous note in the same journal of February 25.

Kephir is a form of fermented milk which has been prepared and in use amongst the inhabitants of the Northern Caucasus for a great length of time, and occupies with them a similar position as an article of diet and medicine to that of kumis in the south-eastern steppes of Russia.

Kumis was first brought into notice in 1784, and has since then been pretty fully investigated and taken a definite position, but kephir has only been generally

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